

Based Upon: PCT/EP00/04758

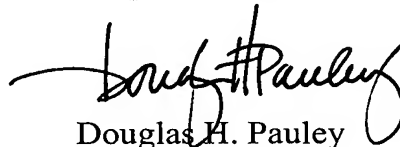
REMARKS

Applicant respectfully requests entry of the above Preliminary Amendment to place this Patent Application in better form for examination and prosecution before the U.S. Patent and Trademark Office.

The claims have been amended to eliminate multiple dependent claims and to more definitely and fully claim the subject matter of Applicant's invention. Applicant urges that the above Preliminary Amendment introduces no new matter into this Patent Application.

Applicant sincerely believes that this Patent Application is now in condition for examination and prosecution before the U.S. Patent and Trademark Office.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) [A] ~~In a~~ breast pump [with] having an attachment (6)[, which is or can be] releasably applied to [the] ~~an~~ opening of a container (2) and having [has] a breast attachment element (6.1), and [with] a manual pump unit (3)[,] which is releasably connected to the attachment (~~6~~) by [means of] a connecting sleeve (5.3) or a connecting bore[, which has] having a cap-shaped connecting section, [as well as] and a pump piston (7)[,] which can be moved back and forth in a stroke chamber (5.2) [by means of] with an actuating handle (4), which is pivotable and [provided with] has a retracting mechanism (8, 8'), the improvement comprising:

[characterized in that]

the cap-shaped connecting section and the stroke chamber (5.2) [are] combined in a mutual cap element (5), which is fixed on the attachment [(5)] (~~6~~) by retaining means (5.1, 5.3), and

the retracting mechanism (8)[,] having one side [of which acts] acting on the actuating handle (4)[, is] and seated with [the] ~~an~~ other side on the cap element (5).

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2. (Amended) [The] In the breast pump in accordance with claim 1, wherein

[characterized in that,]

in [the] a completely inserted state of the pump piston (7), a stroke chamber opening (5.4) on [the] a side of the stroke chamber (5.2) facing away from the breast connection element (6.1) is covered by an upper section (4.1) of the actuating handle (4) which[,] in [the] a position of use[,] is located above a pivot axis.

3. (Amended) [The] In the breast pump in accordance with claim [1 or] 2, wherein

[characterized in that]

the stroke chamber (5.2) in the cap element (5) is curved in an arc-shape in accordance with a movement path of the pump piston (7)[,] which is actuated by [the] an upper section (4.1) of the actuating handle (4).

4. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that,] claim 3, wherein

with the container attached, a pivot path of the upper section (4.1) of the actuating handle (4) [in the area of its] near a connection to the pump piston (7) [has

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been] is selected [to be] so large that[,] in [the] a moved-out state[,] at least an upper edge section of the pump piston (7) is outside of an upper opening edge of the stroke chamber opening (5.4).

5. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 4, wherein a

[the] retracting mechanism (8) has at least one tension spring,

a suspension element (4.3) is positioned on the actuating handle (4), and a further suspension element is positioned on the cap element (5)[, in such a way,] so that with [the] an inserted piston position[, the] a direction of a [the] tensile force lies above [the] a pivot axis of the actuating handle (4)[,] at least until[, with the container (2) attached[, the actuating handle (4) reaches [its] a maximum pivot angle in [the] a retraction direction of the pump piston (7), and

with the container (2) removed and with a further increased pivot angle the direction of the tensile force [lies] is below the pivot axis[, so that the actuating handle (4) is [kept] maintained in [the] an opened position in relation to the cap element (5).

6. (Amended) [The] ~~In the~~ breast pump in accordance with claim
[one of claims 1 to] 4,

[characterized in that] wherein

the retracting mechanism (8') has at least one pressure spring,

a support element (4.7) on [the] ~~an~~ inside of the actuating handle (4) and
a support section (5.11) at the cap element (5) are positioned [in such a way] so that[,]
at least with [the] a piston rod inserted, [the] a direction of [the] force of pressure lies
below the pivot axis of the actuating handle (4).

7. (Amended) [The] ~~In the~~ breast pump in accordance with claim
6, wherein

[characterized in that]

the pressure spring is [embodied as] a spiral spring[, whose] with a front
suspension lug [is] suspended and retained in a support section (5.11) of a free end
section of the retaining element (5.1)[,] which is oriented downward when in use[,]
and arcs upward in a U-shape in an interior chamber of the cap element (5) and the
[grip] attachment (6) and is supported with a free end section bent [off] from the
suspension lug on a support element (4.7) arranged on [the] ~~an~~ inside of the actuating
handle (4).

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8. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 7, wherein

an electric pump [can be] is directly connected [by means of] with a hose to the connecting sleeve (5.3) arranged on the attachment (6) or to the connecting bore.

9. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that

the] claim 8, wherein a connecting point between one of the connecting sleeve (5.3) [or] and the connecting bore and the cap element (5) is sealed by [means] one of a conical connection [or of] and a seal ring.

10. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 9, wherein

an opening is provided on the attachment (6) [in the area of] near one of the connecting sleeve (5.3) [or] and the connection bore, which can be closed by [means] one of a stopper [or, when the stopper has been removed, by] and a hand.

11. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 10, wherein

the retaining means (5.1, 5.3) have a snap-in element (5.1) which snaps together with the attachment (6)[,] when the cap element (5) [has been] is coupled to the attachment (6).

12. (Amended) [The] In the breast pump in accordance with claim 11, wherein

[characterized in that]

the snap-in element (5.1) is embodied as a snap-in tongue (5.1)[,] which is oriented toward the container (2) with a free end section which, in the attached state, extends with a snap-in section behind an edge of the attachment (6) facing toward the container (2) when the cap element (5), located opposite the snap-in tongue (5.1), [has been] is pushed on one of the connecting sleeve (5.3) [or] and the connecting bore, which are oriented axis-parallel in relation to the container (2).

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13. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that

on its] claim 12, wherein an interior of the cap element (5) has one of retaining flaps (5.5) [or] and ribs on both sides[,] which [constitute] form guide elements when [it is] placed on the attachment (6) and securing elements against twisting of the cap element (5) in relation to the attachment (6).

14. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 13, wherein

seating elements are arranged on both of the lateral sections of the cap element (5) [on the one hand] and[, on the other hand] on both lateral sections of the actuating handle (4) which[,] in [the] a form of separable bearing pin/bearing eye connection[, constitute] form the pivot axis between the actuating handle (4) and the cap element (5).

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15. (Amended) [The] In the breast pump in accordance with [one of claims 2 to 14,

characterized in that] claim 14, wherein

in [the] a rear area remote from the breast attachment element (6.1) the cap element (5) has a rounded top which[,] in the pivoted-in state of the upper section (4.1) of the actuating handle (4)[,] makes a steady transition into the [also] curved exterior of the [latter] actuating handle (4).

16. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 15, wherein a

[in] cross section of the upper section (4.1) and the lower section (4.2) are each outwardly rounded on [their] a rear facing away from the breast attachment element (6.1) and make a steady transition into each other, [wherein] and an obtuse angle[,] open toward the rear[,] is formed between the upper section (4.1) and the lower section (4.2).

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17. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 16, wherein

an intermediate piece is [provided, which can be inserted] insertable into a V-shaped gap which[,] when the actuating handle (4) is pivoted[,] is formed in the upper area between [its] the upper section (4.1) and [the] an edge of the stroke chamber opening (5.4), by [means of] which a [the] stroke travel of the pump piston (7) [can be] is preset to be one of continuous [or] and stepped.

18. (Amended) [The] In the breast pump in accordance with [one of the preceding claims,

characterized in that] claim 17, wherein

spacer cams[,] which [come into] contact [with] the upper edge of the container (2) in the attached state[,] are [provided] on [the] an inside of a screw connector (6.2) of the attachment (6) for connecting [it] with the container [(6),] (2) so that an air exchange with an [the] atmosphere is provided in the attached state.

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19. (Amended) [The] ~~In the~~ breast pump in accordance with [one of the preceding claims,

characterized in that] claim 18, wherein

the pump piston (7) has a piston rod (7.3) [formed on it centered or eccentric, on whose] ~~with a~~ backward oriented end section ~~having~~ a releasable hinged connection with the upper section (4.1) of the actuating handle (4) [is provided].

20. (Amended) [The] ~~In the~~ breast pump in accordance with [one of the preceding claims,

characterized in that] claim 19, wherein

a protrusion made of a soft material is arranged on the interior[,] on [the] a container side[,] of the lower section (4.2) of the actuating handle (4) [for] forming a stop between the actuating handle (4) and the container (2).

21. (Amended) [The] ~~In the~~ breast pump in accordance with [one of the preceding claims,

characterized in that] claim 20, wherein

the manual pump unit (3) and the attachment (6) are arranged [in such a way, and their] ~~so that a weight of each~~ is compensated, [that] ~~and~~ in the empty state

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[and] with the attachment (6) placed on [it] and the manual pump unit attached (3), the container (2) remains upright.

22. (Amended) [The] ~~In the~~ breast pump in accordance with [one of the preceding claims,

characterized in that] claim 21, wherein

a secondary air regulating unit (9)[,] which can be operated manually from [the] ~~an~~ outside[,], is [provided] on the cap element (5) for ventilating [the] a suction chamber[,], which varies during [the] a pump operation.

23. (Amended) [The] ~~In the~~ breast pump in accordance with claim 22, wherein

[characterized in that]

the secondary air regulating unit (9) [is provided with] has at least one of a rotatable insert (9.2) [and/or] and an attachment (9.3) arranged on [the] ~~an~~ exterior of the cap element (5) which when rotated [, by means of whose rotation] a flow-through conduit[,], which leads through a wall in the cap element (5) into the stroke chamber (5.2)[,], is one of opened [to a greater or lesser extent, or can be completely] and closed.

BACKGROUND OF THE INVENTION
Field of the Invention

WO 01/34226

PCT/EP00/04758

Milk Sucking Pump

Description of Related Art

[The] ^{This} invention relates to a breast pump with an attachment, which [is or] can be releasably applied to the opening of a container and has a breast attachment element, and with a manual pump unit, which is releasably connected to the attachment by [means of] a connecting sleeve or a connecting bore, which has a cap-shaped connecting section, as well as a pump piston, which can be moved back and forth in a stroke chamber by [means of] an actuating handle, which ^{that} is pivotable and ^{has} [provided with] a retracting mechanism.

^{A known} [Such a] breast pump with a manual pump unit is disclosed in ^{German Patent Reference} DE 87 14 995 U1. With this known breast pump, an attachment with a funnel-shaped breast attachment element and with a pump connector is releasably screwed to a container. A cap-shaped section of the manual pump unit is placed on the pump connecting element. A pump cylinder with a ^{guided} pump piston [guided] in ^{an} [its] interior is attached, horizontally projecting to the rear, to the cap-like section. The pump piston is moved back and forth with [the aid of] a lever-shaped actuating handle wherein, for returning the pump piston, the handle is supported by [means of] a U-shaped spring on a support fastened underneath the pump cylinder which extends as far as the underside of the container. The construction of the manual pump unit is relatively bulky and cumbersome, so that ^{there is one} [disadvantages] [can also result] in [the course of] manipulating it.

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In ^{European Patent Reference} [connection with] another breast pump represented in EP 0 330 845 A2, a manual pump unit has a manual actuating element, which axially extends out of the pump cylinder toward the rear and is moved by one hand in ^{an} [the] axial direction, while the breast pump is held with other hand. Thus, both hands are required for manipulation.

A pump cylinder of a breast pump ^{is} shown in ^{European Patent Reference} EP 0 385 933 A2 is oriented obliquely upward. A pump piston, [which is] guided in its interior, is actuated by [means of] two actuating elements, which are conducted laterally along the pump cylinder, and by a transverse strip, which is hingedly fastened on the actuating elements above the pump cylinder and moves upward when the actuating element is pressed together at the center, and downward, when it is released, in order to move the pump piston back and forth. The actuating unit ^{and} [with] the pump piston can be replaced by an electrical pump, which is connected by [means of] a cover, which can be placed on the top of the pump cylinder.

SUMMARY OF THE INVENTION
 [The] ^{One this} object of [the] invention is ^{to provide} [based on making available] a breast pump of the type mentioned [at the outset,] ^{above but} which [provides] has improved manipulation along with a simplified construction.

This object is ^{achieved with a pump having} [attained by means of the] characteristics [of claim 1,] ^{described in this specification and in the claims} [In accordance therewith it is provided that the] ^A cap-shaped connecting section and [the] ^a stroke chamber are combined in a mutual cap element, which is fixed on [the] ^{an} attachment by ^a retaining

device. A

[means, and that the] retracting mechanism, one side of which acts on the actuating handle, is seated with the other side on the cap element.

Simple cleaning and manipulation are ^{possible because in} [assisted in that, in] the completely inserted state of the pump piston, a stroke chamber opening on the side of the stroke chamber facing away from the breast connection element is covered by an upper section of the actuating handle which, in the position of use, is located above a pivot axis.

An easy movement of the piston and the connected actuation elements, which is free of wear to a considerable extent over time, is achieved [in that] ^{because} the stroke chamber in the cap element is curved in an arc-shape [in accordance with] ^{according to} a movement path of the pump piston, which is actuated by ^{an} [the] upper section of the actuating handle.

The entry of air into the piston chamber and the pumping ^{output} [effect] are [aided in that,] ^{assisted because} [with the container attached, a pivot path of the upper section of the actuating handle in the area of its connection to the pump piston [has been] ^{is} selected to be so large that, in the moved-out state, at least an upper edge section of the pump piston is outside of an upper opening edge of the stroke chamber opening. In a similar manner it [would be] ^{is} possible to cut, for example, a groove, or a bore, or the like, into the piston wall.

A simple, well functioning retracting mechanism is created and cleaning is [made] easier [by means of the steps, wherein] ^{because} the retracting mechanism has at least one tension spring[,] and [that] a suspension element is positioned on the actuating handle[,] and a] ^A further suspension element ^{is positioned} on the cap element[, in such a way,] ^{so} that with the piston in the inserted position, the direction of the tensile force lies above the pivot axis of the actuating handle, at least until, with the container attached, the actuating handle reaches its maximum pivot angle in the retraction direction of the pump piston[, and that with] ^{with} the container removed and with a further increased pivot angle the direction of the tensile force lies below the pivot axis, so that the actuating handle is [kept] ^{maintained} in the opened position [in relation] ^{relative} to the cap element.

[An alternative] ^{In one} embodiment of a well functioning, simple retracting mechanism, [consists in that] the retracting mechanism has at least one pressure spring[, that a] ^A support element on the inside of the actuating handle and a support section at the cap element are positioned [in such a way] ^{so} that, at least with the piston rod inserted, the direction of the force of pressure lies below the pivot axis of the actuating handle. A rubber block, a spiral spring or a [spiral] spring, for example, can be [employed here] ^{used}.

A restoring force which remains stable over time is achieved [here with simple means in that] ^{because} the pressure spring is embodied as a spiral spring[, whose] ^{with} front suspension lug [is] suspended and

retained in a support section of a free end section of the retaining element, which is oriented downward when in use, ^{and} arcs upward in a U-shape in an interior chamber of the cap element and the grip and is supported with a free end section bent off from the suspension lug on a support element arranged on the inside of the actuating handle. In this ^{embodiment} [case] the support section and the support element ^{are} [can be] formed on the retaining element, or ^{on} the actuating handle. The spiral spring, which for example is made of steel, is thermally stable and can be [cleaned by being] boiled. ^{clean} [It] can be simply mounted and can be easily housed so it is invisible. ^{The spiral spring}

The manual pump unit can be easily replaced by an electric pump [in that an electric pump can be] directly connected by [means of] a hose to the connecting sleeve arranged on the attachment or to the connecting bore.

Simple sealing, which ^{promotes} [aids] a good pumping ^{output} [effect], is achieved ^{with} [in that] the connecting point between the connecting sleeve or the connecting bore and the cap element [is] sealed by [means of] a conical connection or of a seal ring.

During electrical operation, if the electric pump does not have automatic ventilation, ventilation can be manually regulated [by {means of} the steps that an] ^{An} opening is provided on the attachment in the area of the connecting sleeve or the connection bore, which can be closed by [means of] a stopper or, when the stopper ^{is} [has been] removed, ^{can be closed} by hand.

A simple, releasable coupling between the attachment and the manual pump unit is achieved [in that] ^{because} the retaining means have a snap-in element which snaps together with the attachment, when the cap element [has been] ^{is} coupled to the attachment. Design and operation are ^{simplified. The} [in this case made easier by the steps in that the] snap-in element is embodied as a snap-in tongue, [which is] oriented toward the container with a free end section and which, in the attached state, extends with a snap-in section behind an edge of the attachment facing toward the container when the cap element, located opposite the snap-in tongue, [has been] ^{is} pushed on the connecting sleeve or the connecting bore, [which are] oriented axis-parallel in relation to the container.

Operation is [furthermore made] easier [in that] ^{because} on its interior the cap element has retaining flaps or ribs on both sides, which [constitute] ^{form} guide elements when [it is] placed on the attachment and securing elements against twisting of the cap element in relation to the attachment.

[The fact that] ^{Because} seating elements are arranged on both lateral sections of the cap element [on the one hand] and [on the other hand] on both lateral sections of the actuating handle which, in the form of separable bearing pin/bearing eye connection, [constitute] ^{form} the pivot axis between the actuating handle and the cap element, [adds to the] ^{there is} simple construction and simple operation.

A shape of the manual pump unit which is advantageous [in respect to] ^{for} cleaning and handling, [consists in that] ^{has} in the rear area remote from the breast attachment element [the] ^a cap element [has] ^{with} a rounded top which, in the pivoted-in state of the upper section of the actuating handle, makes a steady transition into the [also] curved exterior of the latter.

The operation of the manual pump is [made] easier [in that] ^{because} in cross section the upper section and the lower section are outwardly rounded on [their] ^a rear ^{side} facing away from the breast attachment element and make a steady transition into each other [wherein an] ^{An} obtuse angle, open toward the rear, is formed between the upper section and the lower section.

A simple change of the pump output is achieved [in that] ^{because there is} an intermediate piece [is provided,] which can be inserted into a V-shaped gap which, when the actuating handle is pivoted, is formed in the upper area between the upper section of the ^{actuating handle} [latter] and the edge of the stroke chamber opening [and by means of which] ^{Thus} the stroke travel of the pump piston can be preset to be continuous or stepped.

[By means of the steps that] ^{The} spacer cams, which [come into] contact [with] the upper edge of the container in the attached state, ^{there} are [provided] ^{on} the inside of a screw connector of the attachment for connecting it with the container [so that an] ^{An} air exchange with the atmosphere is provided in the attached state, ^{and} [it is achieved]

that] the ventilation of the container is assured when the attachment [has been] ^{is} screwed on the container.

To attach the pump piston in a simple manner, [the means are advantageous that] the pump piston has a piston rod formed on [it] ^{the pump piston,} centered or eccentric, on [whose] ^{which} backward oriented end section a releasable hinged connection with the upper section of the actuating handle is provided.

If [it is provided that] a protrusion made of a soft material is arranged on the interior, on the container side, of the lower section of the actuating handle for forming a stop between the actuating handle and the container, the hard contact of the actuating handle with the container wall is prevented. Here, the stop can also be designed for changing the pivot path for actuating the pump piston.

[Moreover, the steps add to] ^{There is} good handling [that] ^{because} the manual pump unit and the attachment are arranged [in such a way, and] ^{so} their weight is compensated [that in the] ^{In an} empty state and with the attachment placed on it and the manual pump unit attached, the container remains upright.

The interior of the breast pump can be variably ventilated by [means of the steps that] a secondary air regulating unit, which can be operated manually from the outside, [is provided] on the cap element for ventilating the suction chamber, which varies during the pump operation.

There is
 [Here] a simple construction [along with] easy manipulation
 [consists in that] because the secondary air regulating unit [is provided
 with] a rotatable insert and/or attachment arranged on the exterior
 of the cap element, by [means of whose] which rotation a flow-through
 conduit, which leads through a wall in the cap element into the
 stroke chamber, is opened to a greater or lesser extent, or can be
 completely closed. In this case the setting preferably is
 continuous and can be reproduced, for example, [by means of] with markings
 which can be felt. A vacuum is automatically reduced when the
 flow-through conduit is open, and the degree of the vacuum [can be] is
 individually selected. It is advantageous for health care reasons,
 if it is produced from silicon.

BRIEF DESCRIPTION OF THE DRAWINGS
 [The] This invention [will be] explained in greater detail [by means] in view
 of an exemplary embodiment, [making reference to] wherein the drawings.
 Shown are in: show

Figs. 1A to 1E, as views of a breast pump with a container from
 the front, [from] the rear, [from] above, [or] in a perspective
 representation [] ;

Figs. 2A to 2E, as views of a manual pump unit employed with the breast
 pump in a [lateral] side view, [from the] a rear view, [from the] a front view, [from above] a top view
 and [or] in a perspective representation [] ;

Figs. 3A to 3E, as views of an actuating handle employed with the breast
 pump from [the] a front, [from the] a right side, [from the] a left side, [from
 the] a rear, [from below, or from above] a bottom and a top ;

4F
as views of
Figs. 4A to 4E, a cap element employed with the breast pump from [the] side, [from the] rear, [from the] front, [from below, from above, or] in a perspective view;

as views of
Figs. 5A to 5E, a pump piston employed with the breast pump in a perspective view, [from above, from the] side, [from the] rear, [or from the] front;

as views of
Figs. 6A to 6E, a further manual pump unit, in which a different retracting mechanism and a secondary air regulating unit are provided in contrast to the previous exemplary embodiments; and

as views of
Figs. 7A and 7B, a cross section through the manual pump unit in accordance with Figs. 6A, 6D and 6E in a view [from below], or in a detailed view [x].

DESCRIPTION OF PREFERRED EMBODIMENTS

As [can be seen] in Fig. 1, the breast pump 1 has a container 2 for receiving [the] pumped out milk, an attachment 6 screwed on [it], a manual pump unit 3 releasably attached to the latter, [consisting of] an actuating handle 4 and a cap element 5, releasably connected with the [latter].

The attachment 6 is screwed by means of a screw connector 6.2 to a collar section of the container 2, which surrounds the container opening. A breast attachment element 6.1 is connected in a known manner [known per se] to a cover section of the screw connector 6.2, wherein a flow-through valve is arranged approximately in the area of the cover element, through which the pumped milk reaches the container 2 and [can be] prevented from [leaving] the container 2,

or cannot be aspirated back.

On the attachment 6, the manual pump unit 3 with the cap element 5 ^{is} [has been] tightly placed on a connecting element in the form of a sleeve which projects upward parallel with the container axis and has an appropriately matched coupling element 5.3, which is sealed, for example, by means of a cone seal or an additional sealing element and is [represented] ^{shown} in Figs. 2C, 4C and 4D. The coupling element 5.3 is formed on the inside of the upper wall of the cap element 5, extending downward, and makes a transition into a connecting conduit 5.7, which terminates in a stroke chamber also formed in the cap element 5, as shown in Fig. 4B. A retaining element 5.1 in the form of a snap-in tongue projects from the underside of the cap element 5, which snaps into a snap-[] in shoulder at the lower edge of the screw connector 5.2, wherein the snap-in tongue is displaced against its spring force by means of a snap-in ramp at the end, when the cap element 5 is attached.

The stroke chamber 5.2 is arranged in the rear section of the cap element 5 facing away from the attachment element 6.1 and has a stroke chamber opening 5.4 on its rear, while it is closed off toward the front [by means of] ^{with} a front face 5.9. The stroke chamber 5.2 is designed to be curved in accordance with the movement path of a pump piston 7, which is moved back and forth [in it by means of] ^{therein with} the actuating handle 4. Retaining flaps, or retaining strips 5.5 of a retaining element which is U-shaped in

cross section, are provided on the underside of the cap element 5 at the side, and have in their lower area near the free end bearing eyes 5.6 for the insertion of correspondingly designed bearing pins 4.4 of the actuating handle 4 in order to make a releasable, hinged connection of the actuating handle 4 on the cap element 5.

Moreover, strips, which extend ^{Strips extending} essentially parallel with the container axis, ^{are} [have been] formed on both sides of the interior of the front section of the cap element 5, as well as suspension elements 5.8, in which retracting springs 8, for example rubber rings, are suspended, in order to bring, by means of a spring force, the actuating handle 4 attached to the cap element 5 after its deflection back into the initial position, in which the pump piston 7 is introduced into the stroke chamber 5.2, as [can be seen] ^{shown} in Fig. 2A. Corresponding further suspension elements 4.3 are attached to strips 4.5 on the inside of the actuating handle 4. The strips 4.5 also support the bearing pins 4.4, as [can be seen] ^{shown} in Figs. 2C, 3A, 3E and 3F.

With its upper section 4.1, which is located above the hinge axis, the actuating handle 4 makes a steadily curving transition at the top and the sides into the curves of the cap element 5 [and, in]. In the completely inserted position of the pump piston 7, it closes the stroke chamber 5.4, as shown in Figs. 1A and 2A. A lower section 4.2, oriented backward at an obtuse angle, which in cross section is also convexly curved outward, follows the upper section

4.1 of the actuating handle 4 approximately in the area of the pivot axis, so that satisfactory manipulation of the lower handle section 4.2 for performing a pumping operation results [wherein the]. The lower section 4.2 rests against the ball of the thumb, and [wherein] in the transition area between the upper section 4.1 and the lower section 4.2, the thumb and index finger, pointing forward, can grasp the upper container section. A connecting element 4.6 is formed on the inside of the upper section 4.1 for providing a connection with a piston rod 4.3 of the pump piston 7. As [can be seen] ^{shown} in Figs. 5A to 5D, the piston rod 4.3 is formed on a retainer plate 7.2, which [itself constitutes] ^{forms} a part of a piston plate 7.1 with lateral sealing edges. A soft spacer element, not [further represented] ^{shown}, can be provided on the inside in the lower section 4.2 of the actuating handle, so that during actuation the lower section 4.2 gently touches the outside of the container 2, and so that [also] ^{thus} a limitation of the stroke travel of the pump piston 7 can be set [by means of this]. Moreover, an intermediate piece, [also] ^{shown} [represented], can be provided for limiting the stroke travel and therefore the pumping effect which, during the pivoting out of the upper section 4.1 of the actuating handle 4, can be inserted between the edge of the stroke chamber opening 5.4 and the upper section 4.1. An opening, which can be selectively released and can be closed by means of a stopper, can be provided on the back of the attachment 2 for manual ventilation when an electric pump is

attached to the ^{connecting} [conecting] sleeve.

Figs. 6A to 6E, ^{and} [and] 7A, 7B show a further [exemplary] embodiment of the breast pump 1, wherein the manual pump unit 3 [is provided with] ^{has} a secondary air regulating unit 9 and [with] a retracting mechanism 8', which is an alternative to the previous exemplary embodiments. Otherwise the design essentially corresponds to that of the previous embodiment, wherein the reference numerals relate to corresponding parts of the breast pump 1.

The retracting mechanism ^{shown} [represented] in Figs. 6A and 6C has a spiral spring 8', which is essentially bent into a U-shape, wherein the end of [the] one [front leg is angled off to form a suspension lug, while the other leg terminates in an outwardly bent end section. The suspension lug is fixed in a cutout formed in the lower [(in the position of use)] end section ^{in the position of use,} of the retaining element 5.1 in the shape of a support section 5.11, which ^{is} [was] formed during the manufacturing process, while the ^{The} other leg end is inserted and supported in a support element 4.7 formed on the inside of the actuating handle 4. [With these steps, the] ^{The} spiral spring can be easily mounted and removed, for example [in the course of] ^{while} ~~during~~ disassembling the cap element 5 and the actuating handle 4. The spiral spring is preferably embodied as a steel spring and maintains its spring properties permanently and can also be cleaned [without problems] by boiling. In the installed state it projects

with the U-shaped arch upward into a hollow space formed between the cap element 5 and the actuating handle 4, so that it is housed in [an invisible] ^{a hidden} manner.

As [can be seen from] ^{shown in} Figs. 6A, 6B, 6E, 6D [and 7B], 7A, ^{and 7B,} the secondary air regulating unit 9 is arranged laterally on the exterior of the wall of the cap element 5. It has an inlet section 9.1, which is formed in the cap element 5 and slightly projects outward, in which a central receiving pin for an insert 9.2, which can be attached from the outside, as well as a flow-[] through conduit 9.11, which terminates in the stroke chamber 5.2 in the vicinity of the front wall 5.9, are provided, as [can be seen] ^{shown} in Figs. 7A and 7B. An opening 9.21 is formed in the insert 9.2, which [has been] ^{is} aligned or can be aligned with the flow-[] through conduit 9.11. The inlet section 9.1 and the insert 9.2 are covered by a removable cover 9.3, preferably made of silicon, wherein a slot 9.31 can be more or less aligned with the opening 9.21. The opening 9.21 terminates in a laterally widened section, so that the amount of the covering of the conduit leading outward from the stroke chamber 5.2 can be easily varied within a wide range by an appropriate rotation of the cover 9.3. For simple actuation, the cover 9.3 has grip elements, which project rib-like from the circumference, one of which is thickened for marking a position of rotation. As [can be seen] ^{shown} in Fig. 7B [in particular], a lip-like edge of the cover 9.3 extends below an outward projecting

circumferential collar of the inlet section 9.1, so that satisfactory retention and [satisfactory] sealing of the cover 9.3 result.

The secondary air regulation unit 9 provides a continuous, reproducible regulating possibility for air conducted into the suction chamber of the breast pump. A built-up vacuum is automatically reduced by means of the secondary air opening being opened to a greater or lesser extent, and the size of the vacuum can be individually selected. Automatically intermittent pumping can be performed.

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